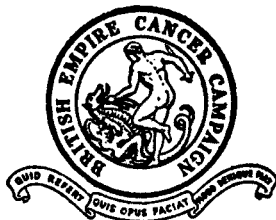


BRITISH EMPIRE CANCER CAMPAIGN
RESEARCH UNIT IN RADIOBIOLOGY

Director :
Dr. L. H. GRAY
B.E.C.C. Nuffield Research Fellow



MOUNT VERNON HOSPITAL
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NORTHWOOD, MIDDLESEX

Telephone : Northwood 3281

25th February 1957

Miss R. Franklin,
Birkbeck College Crystallography Laboratory,
21 Torrington Square,
London, W.C.1.

Dear Miss Franklin,

Thank you for your letter of February 22nd, from which I understand that you observe a deterioration in the crystal structure after a single exposure delivering not more than 100 r. to the crystal. It surprises me very much that you should observe any change at all after so small a dose - in fact such an observation would be of great radiobiological interest. Changes are usually first observed for doses which are several orders of magnitude greater. Perron and Wright (Nature, Lond. 166 (1950) 863) for example, estimated that a marked loss of crystallinity in wet collagen fibres resulted from exposure of fibres to the order of a million roentgens, and dry fibres were appreciably more resistant. A virus is, of course, entirely different chemically but it is a basic fact that a dose of 1 r only produces between 1 and 2 ionisations in each cubic micron of material of unit density, from which you will be able to make your own estimate of the number of defects which a dose of 100 r would be able to produce in your virus molecule. May be your methods are capable of picking up very minute changes in crystal structure.

You would almost certainly produce less change by irradiating the virus dry, but presumably this is of no interest to you. In any case the factor of difference might not be a large one. I think you are on the right lines in trying the effect of irradiating in an atmosphere of nitrogen and at low temperature. If it is permissible to treat your virus with a low concentration of the amino acid cysteine before irradiation in nitrogen, you might find this a little more effective than simply placing the virus in an atmosphere of nitrogen.

I suppose it is not possible that the virus is being influenced by ozone or oxides of nitrogen formed in the air in its immediate vicinity during long exposures.

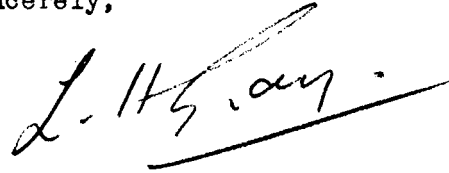
I think these are the only thoughts which occur to me at the present time. I should, however, be interested to discuss further

/over

Contd.

with you any phenomena which you establish as a result of exposure of the virus to doses in the neighbourhood of 100 r.

Yours sincerely,

A handwritten signature in cursive script, reading "L. H. Gray", with a long horizontal flourish extending to the right.

LHG/WAC

Dr. L. H. Gray.